New River (Musky)
2008

Management History

Muskellunge were first stocked in the New River in 1972. The total number of fish stocked varied from year to year until a stocking rate of 1-2 fingerlings per pool acre became the standard. Tiger musky were stocked a few years but survival was poor and anglers were not seeing them, so we went back to stocking pure strain musky. A musky habitat study began in 1992 and lasted through 1995. Pool lengths, widths, and depths were measured on the Clinch, New, James, and Shenandoah Rivers. Aquatic vegetation was identified. Stocking rates and stocking locations were then adjusted to more efficiently allocate the muskies produced in our hatchery system.

Beginning in 2000, a cooperative musky research project between Virginia Tech and our Department, began to evaluate management of the New River musky fishery. Musky captured by electrofishing in the Whitethorne section of the river were outfitted with radio transmitters and tracked weekly for three years. During that time, additional sampling was done each winter and early spring throughout the New. Stomachs of each collected musky were pumped for food items, and most fish were released back into the river. A select few were sacrificed for additional internal investigations, and a bone called the cleithra, found in the gill covering plate, was removed for aging of the fish. Data analysis lead researchers to recommend an increase in the minimum harvest length from 30 inches to 42 inches, and a decrease in the creel limit from two fish per day to one fish per day on the entire New River and its impoundments. The new regulations were approved and went into effect on July 1, 2006.

Current Management Project

One of the goals of the New River musky stocking program has been to produce a self sustaining, naturally reproducing population of fish, with the understanding that periodic stockings would have to be done to support the population. For the last 20 years or so, musky reproduction was considered possible in the New, particularly in the lower river below Claytor Lake because of the abundant habitat, forage, and adult population found there. To document reproduction, a plan was devised to skip a couple of years of stockings in the lower river in 2004 and 2006, and to intensively sample for young-of-year (YOY) musky the following winters (when the fish would be nearly a year old). If young fish were found, it would be assumed that they were naturally reproduced. In addition, all musky

stocked in 2005 received a fin clip, and all those stocked in the lower river in 2007 were clipped and given a pink visual implant elastomer (plastic) mark in their anal fin.

Our musky, produced at the Buller Fish Cultural Station near Marion, VA, are usually four to six inches in length when stocked. A change was made in the program in 2007 for the New River fish. Following the draining of the production pond at Buller, the New River fish were stocked back into the pond after it was refilled. They were fed with minnows for an additional three months and when the pond was drained in September, the musky averaged nine inches with some as long as twelve inches in length. The purpose of the grow-out plan was to stock a larger fish, hoping for better survival the first year.

Management Project Results

Electrofishing on the lower New in January and February, 2005, resulted in the capture or close observance (defined as just out of reach of the net!) of 25 YOY musky, which equates to a catch-per-effort (CPE) rate of 1.6 YOY musky per hour of electrofishing (Table 1). On the upper New at Fosters Falls and Austinville during that same time period, only one YOY was captured for a CPE of 0.1 per hour (Table 2). All of these 26 YOY had to have been naturally reproduced since no musky were stocked in 2004.

Sampling on the lower river in 2006 resulted in approximately the same YOY CPE at 1.5 per hour, and a slight increase in the upper river to 0.5 YOY per hour. The increase in CPE on the upper river is not really significant as it reflects the capture of only two young musky rather than one the year before. None of the YOY captured in 2006 exhibited the fin clip done to 2005 stocked musky. Here again is evidence of natural reproduction. In addition, several two year old musky were captured in 2006 that came from a non-stocked year in 2004. It was decided that sampling for YOY musky should be concentrated more on the lower New for the next two years where natural reproduction appeared to be much more significant.

There was a slight drop in YOY CPE on the lower New in 2007 to 1.2 per hour. But as in 2005, all 25 fish were the result of natural reproduction since no stockings took place in 2006. CPE remained the same on the upper river but again, only two YOY were caught there.

A dramatic increase in the number of YOY musky collected took place below Claytor Lake in 2008, all the way to West Virginia. Young fish were found in high numbers at almost every sampling location for a CPE of 7.7 per hour. The most significant thing about this was that only three fish exhibited the pink elastomer mark and fin clip of the 2007 stocked musky. The rest of the more than 100 YOY were wild fish. Only one short sample was done above Claytor and no musky were seen.

Adult musky were captured and/or observed each year of the investigation (Tables 1 & 2). Adult CPE had been slowly increasing on the lower river but then dropped significantly in 2008. Sampling conditions were poor for adult collections in 2008 as the water was low and extremely clear for most of the sample dates. Large musky tend to remain more in the middle of the river under these conditions and they are not easily sampled

there. They can also easily avoid the electric field when the water is clear and they can see the boat from a distance. CPE on the upper river decreased each year on the upper river but was most likely the result of the decrease in sampling effort there. The most abundant size group of adult fish observed on both sections of the New has been fish in the mid to upper 30 inch range. However, musky up to 45 inches were routinely seen.

Current Population Status

The New River, particularly the reach from Claytor Dam downstream to West Virginia, has been and remains today, the premier destination to fish for large musky in Virginia (Table 3). Anglers have registered 361 citation size musky (40 inches or 15 pounds) over the last eleven years, including eight over 50 inches (Table 4). The present state record, a 53 inch, 45.5 pound giant, was caught in the lower New June 1, 2007. Based on the weight of eggs taken from a 39 pound musky sacrificed during the joint VT/DGIF study, this female musky undoubtedly would have weighed over 50 pounds back in the spring during spawning season.

Almost half of the registered citation musky were caught during the May through July time period. The coldest months of December through January produced the second highest total of citation fish. Many large musky are caught by smallmouth anglers throughout the year, but the majority of the winter citations are registered by dedicated musky anglers fishing the river pretty much by themselves. March and September are the two months when the lowest number of citations are registered from the New. During March there is a migration from winter holes to spawning areas, and in September, the migration is back to their winter holes. It becomes difficult for anglers to find the moving fish during those months.

Although Table 4 shows that harvest of citation size musky has decreased over the last five years, 45% of the citation fish were harvested from 1997 through 2007. This high rate of angler harvest was one of the main reasons that the size limit was raised to 42 inches in 2006. Almost 50% of the citations were for fish under 42 inches and it is a good thing that those size musky are now protected from harvest. Up to about 40 inches or so, musky grow more in length than weight, but from there on up they really pack on the pounds and become true trophy fish.

Musky natural reproduction was first documented in 2005, and verified in 2007 and 2008. Natural reproduction by musky in the lower New produced an outstanding year class of young fish in 2007. Aquatic weed beds and backwater eddies covered in leaves are prime spawning areas for musky and the lower New has these habitats in great abundance. The question remains as to whether or not natural reproduction alone can maintain the musky population at its present level in the lower New. Although winter musky sampling has not yet been as frequent on the upper river, spring bass, sunfish, and walleye sampling has not shown musky reproduction to be significant upstream of Claytor Lake.

A couple of weeks after this report was written, we spent almost two hours electrofishing two sections of the lower New in order to collect adult brood fish for

Buller Hatchery. All total, close to 30 adult musky (up to approximately 30 pounds) and eight YOY were collected in that short time.

Management Recommendations

The 2008 lower New River musky stocking should be cancelled due to the finding of an extremely abundant 2007 year class. Natural reproduction in 2007 should be able to support the fishery without stocking in 2008. Fin clips collected from sampled musky in 2007 and 2008 should be genetically analyzed at Virginia Tech to determine if a unique native stock of musky exists in the New River. Intensive sampling should continue on the lower New during January and February 2009, to continue documentation of natural reproduction. The results of that sampling and the genetic research should be used to develop a long term stocking plan for the lower river. One idea is to base whether to stock and the number to stock on winter surveys of the abundance of the previous years YOY portion of the fishery. Consideration should be given to always stocking advanced fingerlings of at least nine inches to increase the chance of survival. Smaller musky are too easily preyed upon immediately after stocking.

The 650 musky to be stocked in the upper New River in 2008 should be grown to advanced fingerling size as they were in 2007. Those to be stocked in 2009 should also be grown to advanced fingerling size prior to stocking, and also marked in some way to facilitate an investigation into quantifying natural reproduction. Surveys should occur during the winter of 2009 as time allows, but intensive sampling needs to be a priority in 2010 to look for the marked individuals stocked in 2009.

Table 1. Catch-per-effort (CPE) for young-of-year (YOY) and adult musky collected by electrofishing in the lower New River (Claytor Lake to West Virginia). CPE includes captured and observed musky per hour of effort. Number of fish in parenthesis.

Year	Effort	YOY CPE	Adult CPE	Total CPE
2005	15.78	1.6 (25)	1.3 (21)	2.9 (46)
2006*	25.55	1.5 (39)	2.0 (52)	3.6 (91)
2007	20.80	1.2 (25)	2.2 (45)	3.4 (70)
2008	13.93	7.7 (107)	0.6 (8)	8.3 (115)

* Musky were not stocked in 2004 and 2006 in the lower New.

Table 2. CPE for musky collected by electrofishing in the upper New River (Foster Falls and Austinville pools).

Year	Effort	YOY CPE	Adult CPE	Total CPE
2005	7.61	0.1 (1)	1.7 (13)	1.8 (14)
2006	4.37	0.5 (2)	1.4 (6)	1.8 (8)
2007	2.00	0.5 (2)	0.5 (1)	1.5 (3)
2008	1.57	0.0	0.0	0.0

Table 3. Reported musky citation numbers from various waters in Virginia from 1997 through 2007.

Year	New	James	Cow*	Clinch	Shen*	SML*	Burke	RR*
1997	33	11	4	4	0	7	3	1
1998	25	19	0	0	0	0	4	4
1999	38	7	0	1	1	4	3	2
2000	25	14	1	3	3	0	0	6
2001	29	12	2	2	0	0	3	4
2002	30	2	1	0	1	2	2	0
2003	28	15	1	0	1	0	4	4
2004	40	12	0	1	0	3	2	3
2005	33	9	0	1	2	1	0	2
2006	34	15	5	0	2	2	0	2
2007	46	15	0	0	2	1	0	2
Totals	**361**	**131**	**14**	**12**	**12**	**20**	**21**	**30**

* Cowpasture, Shenandoah R., Smith Mtn. Lake, Rural Retreat Lake

Table 4. Reported musky citation numbers for different inch groups for the entire New River from 1997 through 2007.

Year	38-41.9	42-49.9	>/= 50	Totals	# Creeled	%Creeled
1997	18	15	0	33	17	52
1998	11	14	0	25	15	60
1999	21	17	0	38	19	50
2000	16	7	2	25	13	52
2001	15	14	0	29	17	59
2002	9	21	0	30	14	47
2003	17	10	1	28	15	28
2004	19	19	2	40	17	43
2005	20	12	1	33	10	30
2006*	11	22	1	34	13	38
2007	20	25	1	46	12	26
Totals	**177**	**176**	**8**	**361**	**162**	**45**

* The minimum harvest length increased from 30” to 42” on July 1, 2006.

For additional information, contact Joe Williams in the Blacksburg Field Office. He can be reached by phone at 540-961-8304, mailbox 3, or through email at Joe.Williams@dgif.virginia.gov.